

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) An automatic sample collection device for use with a slab gel electrophoresis system having one or more lanes, the sample collection system comprising:

a detection zone within the slab gel;

a detector for detecting a sample of interest within the detection zone;

a gel free zone within the slab gel, wherein the gel free zone is filled with a buffer solution, wherein the detection zone and the gel free zone are aligned with each other; and

a collector for collecting the detected sample of interest comprising an energizable pump operably connected to the detector, the energizable pump configured to direct a low volume stream of liquid buffer solution onto a detected sample of interest, thereby collecting the sample of interest within the stream of buffer solution.

2. (canceled).

3. (canceled).

4. (canceled).

5. (canceled).

6. (currently amended) The automatic sample collection device of claim 1 ~~5~~, wherein the collector further comprises a sample collection vial configured to receive the stream of liquid buffer solution and the collected sample of interest.

7. (currently amended) The automatic sample collection device system of claim 1 5, wherein the buffer solution is selected from the group consisting of TAE (tris-acetate EDTA), potassium tartrate, and TBE (tris-boric acid EDTA).

8. (currently amended) The automatic sample collection device system of claim 1, wherein the detector comprises a fluorescent tag attachable to a sample of interest.

9. (currently amended) The automatic sample collection device system of claim 8, wherein the detector further comprises a laser positioned to direct a laser beam to excite the fluorescent tag within the detection zone.

10. (currently amended) The automatic sample collection device system of claim 9, wherein the laser beam is scanned between multiple lanes of the slab gel.

11. (currently amended) The automatic sample collection device system of claim 9, further comprising one or more transmission optical fibers connecting the laser with one or more detection zones of a slab gel, the one or more transmission optical fibers configured to transmit a laser beam from the laser to one or more detection zones.

12. (currently amended) The automatic sample collection device system of claim 9, wherein the laser is an argon ion laser.

13. (currently amended) The automatic sample collection device system of claim 9, wherein the detector further comprises one or more collection optical fiber imbedded within the gel.

14. (currently amended) The automatic sample collection device system of claim 13, wherein the one or more collection optical fibers are positioned adjacent one of the one or more sample lanes and to collect light emitted from the fluorescent tag.

15. (currently amended) The automatic sample collection device system of claim 9, wherein the detector further comprises low-level light detection electronics.

16. (currently amended) The automatic sample collection device system of claim 15, wherein the low-level light detection electronics are selected from the group comprising photomultipliers, photodiodes and CCD (charge coupled device) cameras.

17. (currently amended) The automatic sample collection device system of claim 15, wherein the detector further comprises an optical filter positioned between a collection optical fiber imbedded within the gel and the low-level light detection electronics

18. (currently amended) The automatic sample collection device system of claim 17, wherein the optical filter comprises a high band pass filter for filtering light with a wavelength greater than about 500 nm and a notch filter.

19. (currently amended) The automatic sample collection device system of claim 18, wherein the optical filter comprises a narrow band pass filter which filters light other than light

with a wavelength corresponding to the wavelength of the light emitted from the fluorescent label, ± 10 nm.

20. (currently amended) The automatic sample collection device system of claim 1, wherein the sample of interest is selected from the group comprising a nucleic acid, a polypeptide, and a protein.

21. (currently amended) A sample collection system for use with an electrophoretic slab gel having one or more sample lanes, the sample collection system comprising:

- a detection zone within the slab gel;
- a fluorescent tag attachable to a sample of interest,
- a laser configured to direct a laser beam on the fluorescent tag when the sample of interest is within the detection zone, the laser beam exciting the fluorescent tag;

- low-level light detection electronics positioned to detect light from the excited fluorescent tag;

- a gel free zone within the slab gel, wherein the gel free zone is filled with a buffer solution, wherein the detection zone and the gel free zone are aligned with each other; and

- a collector for collecting the detected sample of interest, wherein the collector comprises an energizable pump operably connected to the low level light detection electronics, the energizable pump configured to direct a stream of liquid buffer solution onto a sample of interest within a gel free zone, thereby collecting the sample of interest within the stream of buffer solution.

22. (canceled).

23. (currently amended) The sample collection ~~device~~ system of claim 22, wherein the collector further comprises a sample collection vial configured to receive the stream of liquid buffer solution and the collected sample of interest.

24. (currently amended) The sample collection system of claim 21, wherein the laser is an argon ion laser.

25. (currently amended) The sample collection system of claim 21, wherein the fluorescent tag is a cyanine nucleic acid dye ~~selected from the group consisting of PICO Green, TO-PRO 1, and TO-PRO 3.~~

26. (currently amended) The sample collection system of claim 21, further comprising a collection optical fiber imbedded within the slab gel and positioned to collect fluoresce from the excited fluorescent tag.

27. (currently amended) The sample collection system of claim 26, further comprising an optical filter positioned between the optical fiber and the low-level light detection electronics.

28. (currently amended) The sample collection system of claim 26 ~~29~~, wherein the optical fiber is positioned adjacent one of the one or more sample lanes and to collect light emitted from the fluorescent tag.

29. (currently amended) The sample collection system of claim 21, wherein the low-level light detection electronics are selected from the group comprising photomultipliers, photodiodes and CCD (charge coupled device) cameras.

30. (original) The sample collection system of claim 21, wherein the sample of interest is selected from the group comprising a nucleic acid, a polypeptide, and a protein.

31. (currently amended) A method of collecting a sample band from a electrophoresis slab gel, the method comprising:

obtaining a sample of interest;

loading the sample of interest into a lane of a gel electrophoresis system with one or more sample lanes, the gel electrophoresis system comprising a sample collection system comprising a detection zone within the slab gel, a detector for detecting a sample of interest within the detection zone, a gel free zone within the slab gel, wherein the gel free zone is filled with a buffer solution, wherein the detection zone and the gel free zone are aligned with each other, and a collector for collecting the detected sample of interest, wherein the collector comprises an energizable pump operably connected to the detector, the energizable pump configured to direct a stream of liquid buffer solution onto a detected sample of interest within a gel free zone, thereby collecting the sample of interest within the stream of buffer solution;

detecting a sample within the detection zone; and

collecting the sample of interest from the slab gel.

32. (currently amended) The method of claim 31, ~~wherein the collector comprises an energizable syringe pump operably connected to the detector, the energizable syringe pump configured to direct a stream of liquid buffer solution onto a detected sample of interest within a~~

~~gel free zone, thereby collecting the sample of interest within the stream of buffer solution, the method further comprising energizing the syringe pump.~~

33. (original) The method of claim 31, wherein the sample of interest is selected from the group comprising a nucleic acid, a polypeptide, and a protein.

34. (original) The method of claim 31, wherein the detector comprises a fluorescent tag attachable to a sample of interest.

35. (original) The method of claim 31, wherein the detector comprises a laser positioned direct a laser beam on the fluorescent tag, the laser beam exciting the fluorescent tag within the detection zone, the method further comprising activating the laser to excite the fluorescent tag.

36. (original) The method of claim 31, wherein the detector further comprises low-level light detection electronics.

37. (currently amended) The method of claim 36, wherein the low-level light detection electronics are selected from the group comprising photomultipliers, photodiodes and CCD (charge coupled device) cameras.